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Revision of *Neuraphes* Thomson of the Himalaya Mts. (Coleoptera: Scydmaenidae)

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Abstract. Species of *Neuraphes* Thomson known to occur in the Himalaya Mts. are revised. The following species are redescribed or described (all in the subgenus *Pararaphes*): *N. aruensis* Franz, *N. himalayanus* Franz, *N. jumlanus* Franz, *N. taksangensis* Franz, *N. khumbuanus* n. sp., and *N. tibetanus* n. sp. *Neuraphes kashmirensis* Franz was found to be conspecific with *N. aruensis* Franz, and the former name is designated as a junior subjective synonym of the latter; *Neuraphes gartneri* Franz is transferred to *Scydmoraphes* Reitter. Diagnostic characters of the treated species are given and illustrated, including the aedeagi. *Neuraphes tibetanus* is the first member of the genus reported to occur in China.

Key words: entomology, taxonomy, Coleoptera, Scydmaenidae, Cyrtoscydmini, *Neuraphes*, new species, East Palearctic, Himalaya Mts.

INTRODUCTION

Neuraphes Thomson is an exclusively Palearctic genus represented by 111 species, most of them are distributed in Europe (Löbl & Smetana 2006). Outside the western part of the region members of *Neuraphes* seem to be very rare and in most cases restricted to mountainous areas, including high mountain ranges like the Himalaya Mts., or cool areas of the Russian Far East (Primorskiy Kraj) and Japan (Hokkaido). A review of the Franz Collection undertaken during my visit in Vienna in 2004 revealed a surprising number of possible misidentifications of specimens representing the only six known Himalayan species of *Neuraphes*. These are *N. himalayanus*, *N. kashmirensis*, *N. aruensis*, *N. taksangensis*, *N. jumlanus*, and *N. gartneri*, all described by Franz. The holotypes of *N. aruensis* and *N. kashmirensis* (these species were described in the same paper) seemed to be conspecific, judging from their external appearance. Their aedeagi were illustrated by Franz after they have been immobilized in the mounting medium in more or less random position (which was a common procedure in the case of this author), and remounting was necessary to compare their shapes. A single, non-dissected male placed in a drawer together with *N. jumlanus* certainly was misidentified; it seemed much more similar to the holotype female of *N. taksangensis*. Also a male mislabeled by Franz as an allotype of *N. himalayanus*, in fact a non-type specimen, did not agree in some important details with the holotype female. Since one of primary diagnostic characters of *Neuraphes* is the ante-basal transverse groove on the pronotum disrupted in middle or interrupted by a short longitudinal carina, *N. gartneri* with its clearly entire basal groove seemed to have been placed in a wrong genus. Moreover, the aedeagus of this species illustrated by Franz (1979) in his original description shows structures more resembling copulatory organs found in *Scydmoraphes*. All these uncertainties are clarified in this paper, which provides redescriptions of all species of *Neuraphes* described from the Himalaya Mts. by Franz. Moreover, one male specimen was found to have been misidentified by Franz, and as it represents an undescribed species, it is here described as new, together with additional *Neuraphes* from Tibet collected recently by Andreas Pütz, and kindly sent to me for study. All species of *Neuraphes* treated here do not posses a pair of pits on the vertex, and therefore they belong to the subgenus *Pararaphes*.

The studied materials are deposited in the Naturhistorisches Museum Wien, Vienna, Austria (NHMW) and a private collection of Andreas Pütz, Eisenhüttenstadt, Germany (CAP). The measurements are as follows: body length is a sum of separate lengths of the head, pronotum and elytra; length of head is measured along midline from the anterior margin of the frontoclypeal region to the occipital constriction; width of head includes eyes; length of pronotum is measured along midline; width of pronotum is maximum; length of elytra is measured along suture from a hypothetical line joining humeri to the posterior margin; width of elytra is combined, maximum; elytral index (EI) is length of elytra divided by width. When necessary (i.e., for new species, synonyms and new combinations), the studied specimens were provided during the present study with additional, printed labels (red for holotypes, white for other cases) with the genus and subgenus names in large letters, species name in small letters, and "det. P. JAŁOSZYŃSKI, 2007".

TAXONOMY

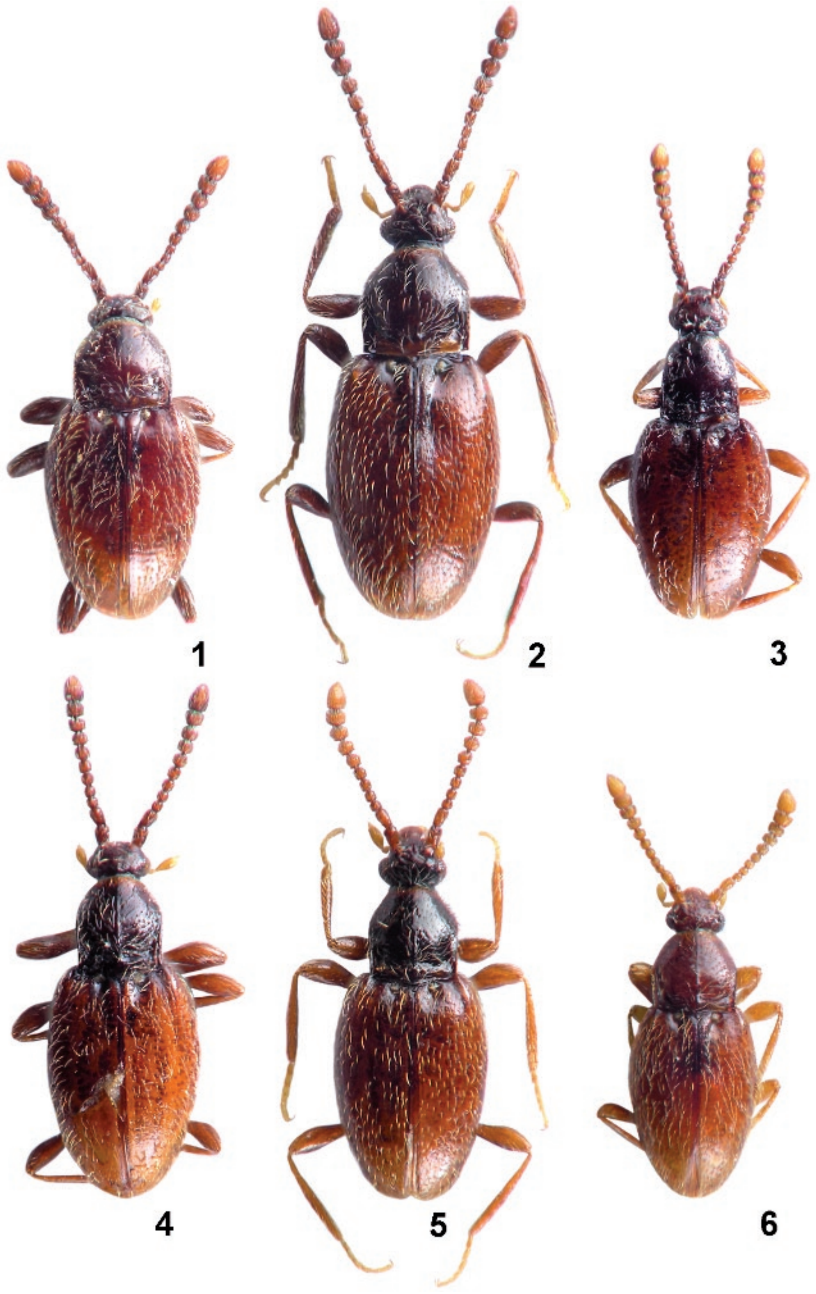
Neuraphes* (*Pararaphes*) *taksangensis **Franz**

(Figs. 1, 7-9)

Neuraphes (*Pararaphes*) *taksangensis* Franz, 1973: 123.

Diagnosis

Males and females of this species differ from all congeners from the Himalaya Mts. in the following combination of characters: anterior third of each elytron bears sharply marked, narrow and deep adsutural groove separating highly raised area along suture, grooves are equally deep from base to their posterior ends, where they are abruptly



1-6. Dorsal habitus of holotypes (to the same scale). 1 – *Neuraphes taksangensis* Franz, male; 2 – *Neuraphes jumlanus* Franz (male); 3 – *Neuraphes himalayanus* Franz (female); 4 – *Neuraphes khumbuanus* Jałoszyński (male); 5 – *Neuraphes tibetanus* Jałoszyński (male); 6 – *Neuraphes aruensis* Franz (male) terminated; and antennomere IV is as long as broad. The unique aedeagus can be used to distinguish this species from world representatives of *Neuraphes*.

REDESCRIPTION

Male (Fig. 1). Body moderately large, relatively stout; length 1.60 mm; head dark brown, pronotum, antennae and legs except tarsi slightly darker, reddish brown, elytra distinctly lighter, reddish brown; tarsi and maxillary palps light brown; vestiture light brown. Head broadest at large, coarsely faceted eyes, length 0.25 mm, width 0.30 mm; tempora in dorsal view about as long as half of length of eye; vertex regularly convex; large central part of frons flat; supraantennal tubercles very weakly raised and not delimited from surrounding areas. Punctation on vertex and posterior part of frons composed of unevenly distributed, relatively sparse and small, moderately sharply marked punctures, median and anterior parts of frons bear larger and denser punctures which are shallow and with smooth margins, those between supraantennal tubercles are separated by spaces slightly shorter than puncture diameters. Setation of head composed of sparse, moderately long, suberect to erect setae, which are longest on posterior and lateral parts of frons and on vertex, where they are directed posteriorly and toward midline. Antennae moderately long and slender, gradually thickened toward apices, length 0.80 mm; antennomere I slightly more than twice as long as broad; II slightly shorter and narrower than I, about twice as long as broad; III narrower than II, much shorter than broad, IV about as long as broad; V-VII each slightly longer than broad; VIII about as long as broad; IX and X each slightly broader than long; XI about 1.7x as long as broad.

Pronotum short and broad, approximately subtrapezoidal in shape, nearly equally broad from near base to about anterior third; length 0.40 mm, width 0.42 mm. Anterior margin broadly rounded, in dorsal view indistinctly delimited from lateral margins, which are broadly rounded in anterior third and nearly straight in posterior part, minimally narrowing just before slightly obtuse hind angles; posterior margin in its median part (shorter than 1/3 of margin) is distinctly expanded toward scutellum. Base of pronotum bears not groove but rather well separated two pairs of pits; lateral pits located near hind angles are smaller, longitudinally elongate and slightly shifted anteriorly; internal pair of pits adjacent to sides of median longitudinal carina is larger, each pit is roughly circular; median carina narrow, very distinct between pits, reducing in height and width anteriorly, it is discernable up to about middle of pronotum. Punctation of disc composed of very small, shallow but sharply marked and moderately sparse punctures unevenly distributed, with several larger, but very diffused and shallow punctures along median carina; setation relatively sparse, moderately long, suberect.

Elytra oval, broadest distinctly anterior to middle, length 0.95 mm, width 0.65 mm, EI 1.46. Humeri moderately distinct; basal pit on each elytron large; narrow adsutural area at base of each elytron as long as slightly less than 1/3 of elytron is raised and sharply delimited by narrow, relatively deep groove abruptly terminated at its posterior end; subapical area on each elytron bears large pore accompanied by subcuticular excavation (well visible in transparent mounts in water or glycerol) surrounded by setae longer than those on anterior half of elytra, pore is located on slightly raised cuticle and adsutural area of each elytron between pores is slightly impressed; pores are located slightly closer to posterior than to adsutural margins of elytra. Punctation much more distinct than that on pronotum, composed of larger, but shallow and diffused, unevenly distributed and relatively dense punctures, which in middle and in posterior half of each elytron form indistinct rows transverse or slant in relation to suture. Setation similar to that on pronotum. Metathoracic wings not studied.

Legs slender, moderately long, without peculiar characters.

Aedeagus (Figs. 7-9) 0.21 mm in length, in dorso-ventral view drop-shaped with narrow indistinctly subtrapezoidal base and broad subapical part; ventral median subapical plate subrectangular, very long and relatively lightly sclerotized; lateral subapical sclerites elongate and distinctly curved laterally at apices, darkly sclerotized; internal armature located in apical part and well visible in dorsal view consists of broad, curved duct narrowing to pointed apex; parameres long and very broad, in lateral view strongly and rapidly bent at obtuse angle.

Female. Similar to male, but slightly stouter, with broader pronotum and elytra, median carina on pronotum well visible only between basal pits; apices of elytra without large pores. Body length 1.65 mm, length of head 0.25 mm, width of head 0.30 mm, length of antennae 0.77 mm, length of pronotum 0.45 mm, width of pronotum 0.45 mm, length of elytra 0.95 mm, width of elytra 0.70 mm, EI 1.36.

Type material

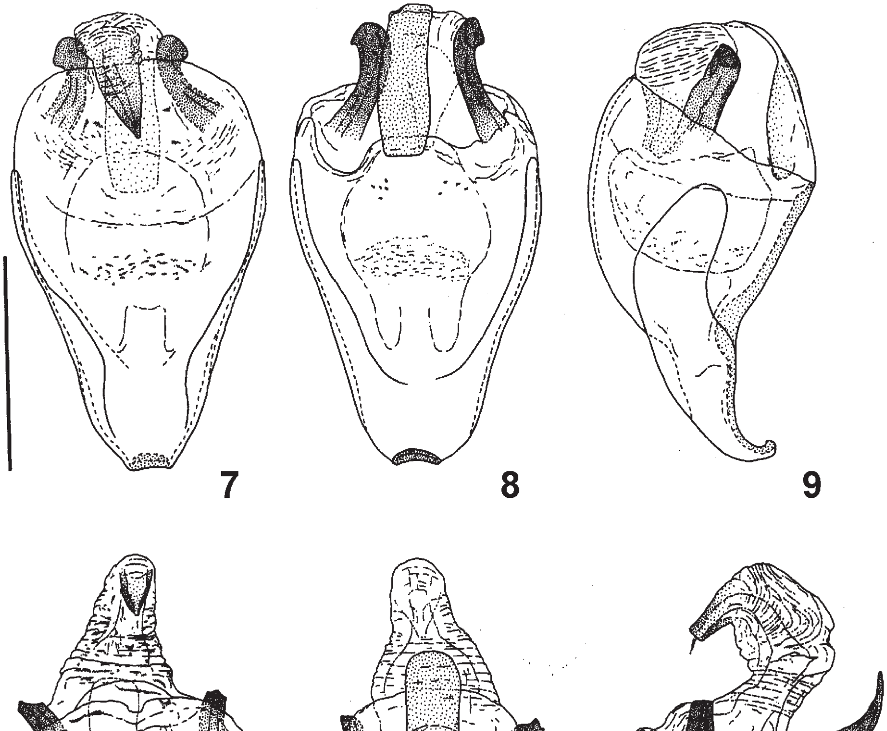
Holotype (female): two white printed labels: “Zentral-Nepal, Sept.-Okt. 1971, lg. H. Franz”, “Taksanggeb., b. Tuche, Takola”, white label with handwritten “Neuraphes taksangensis m.” and printed “det. H. Franz”, small white label with handwritten female symbol, and red handwritten label “Typus” (NHMW). Additional material: male, “Dampelek b. Jumla”, “Gebiet von Jumla, Westnepal, lg. H. Franz” (NHMW).

Distribution

Nepal.

Remarks

Neuraphes taksangensis was described on the basis of a single female. A single male externally very similar to the holotype female was found among specimens placed together with *N. jumlanus*. It clearly differs from the latter species in having much smaller body with the pronotum not so dark as that in *H. jumlanus*, and stouter antennae, with the antennomere IV as long as broad, whereas this antennomere in *H. jumlanus* is much longer than broad. Moreover, the elytra in *H. jumlanus* are covered with much smaller punctures, and the small pore on the subapical area of each elytron representing a male dimorphic character is located much closer to the adsutural than to the posterior margin of elytron (much closer to the posterior margin in *N. taksangensis*). These two species share the adsutural groove on the anterior part of each elytron, which is not gradually reducing in depth toward its posterior end but it is abruptly terminated; also punctures on posterior part of elytra tend to form indistinct transverse or slant rows. The male recognized here as belonging to *Neuraphes taksangensis* has a very similar aedeagus to that of the holotype of *H. jumlanus*. However, direct comparison is difficult due to fully erected condition of the aedeagus of the latter specimen, and probably broken off apical parts of the lateral subapical sclerites. The aedeagi clearly differ in the shape of the parameres in lateral view (strongly bent in *N. taksangensis* vs. weakly curved in *N. jumlanus*) and also in the shape of the ventral subapical median plate (subrectangular in both cases, but very long and narrow with well marked corners



7-12. Aedagus of holotype in dorsal (7, 10), ventral (8, 11), and lateral (9, 12) views. 7-9 – *Neuraphes taksangensis* Franz; 10-12 – *Neuraphes jumlanus* Franz (scale bars: 0.1 mm) in *N. taksangensis* vs. shorter and broader with proximal and distal margins rounded together with lateral ones).

The locality given on the label of the holotype is “Taksanggeb., b. Tuche, Takola”, whereas the one described by Franz (1973) differs in spelling and reads “Taksanggebiet bei Tuktsche”. Moreover, the date given in that paper is more precise than “Sept.-Okt. 1971” found on the label, and it is 23. ix. 1971; the original description provides also more details not given on the label: the altitude of 3200 m, and a leaf litter of a *Pinus/ Abies* forest as a substrate where the specimen was taken from.

***Neuraphes* (*Pararaphes*) *jumlanus* Franz**

(Figs. 2, 10-12)

Neuraphes (*Pararaphes*) *jumlanus* Franz, 1974: 87, fig. 2.

Diagnosis

Males and females of this species clearly differ from all Himalayan congeners in having large, elongate body, in mature individuals with contrasting, dark brown head and pronotum and reddish brown elytra; anterior third of each elytron bears sharply marked, narrow and deep adsutural groove separating highly raised area along suture, grooves are equally deep from base to their posterior ends, where they are abruptly terminated; and antennomere IV is much longer than broad. The unique aedeagus can be used as a primary diagnostic character for discriminating this species from world representatives of *Neuraphes*.

Redescription

Male (Fig. 2). Body relatively large; length 1.95 mm; head and pronotum very dark brown, nearly black, antennae and legs except tarsi dark brown, elytra reddish brown, tarsi and maxillary palps light brown; vestiture light brown, on darkest body parts it appears silver. Head broadest at very large, coarsely faceted eyes, length 0.30 mm, width 0.35 mm; tempora in dorsal view short, about as long as half length of eye; vertex regularly convex; frons in posterior part weakly convex, in anterior part steeply lowering toward clypeus; supraantennal tubercles recognizable, but weakly raised and not delimited from surrounding areas. Punctation on vertex and posterior part of frons fine and sparse, anterior part of frons bears sparse but relatively large and sharply marked punctures, which between supraantennal tubercles are separated by spaces about equal to or slightly longer than puncture diameters. Setation of head composed of sparse, moderately long, suberect to erect setae. Antennae long and slender, gradually thickened toward apices, length 0.95 mm; antennomere I slightly more than twice as long as broad; II about as long as I but slightly narrower, about 2.5x as long as broad; III much narrower than II and about as long as broad; IV-VII each much longer than broad; VIII slightly longer than broad; IX about as long as broad; X slightly transverse; XI about 1.8x as long as broad.

Pronotum elongate, subtrapezoidal in shape, equally broad from base to anterior third, length 0.50 mm, width 0.47 mm. Anterior margin broadly rounded, much shorter than posterior margin; sides in anterior third strongly rounded, in posterior part lateral margins straight; hind angles obtuse but sharply marked; posterior margin arcuate, minimally expanded toward scutellum in middle part; base of pronotum with large, shallow and longitudinally elongate pit near each hind angle and short median longitudinal carina as long as about 1/4 of length of pronotum, carina is constricted in middle, where it is accompanied at each side by roughly circular, distinct impression. Punctation of disc very fine, composed of very small, but sharply marked and sparse punctures, surface between punctures very glossy; setation relatively sparse, moderately long, suberect.

Elytra oval, broadest slightly anterior to middle, length 1.15 mm, width 0.77 mm, EI 1.49. Humeri moderately distinct; basal pit on each elytron large; narrow adsutural area in anterior third of each elytron is raised and sharply delimited by narrow, relatively deep groove abruptly terminated at posterior end; apex of each elytron bears small pore accompanied by subcuticular globular excavation (well visible in water or glycerol mounts), pore is located on slightly raised area, much closer to adsutural than to posterior margin of elytron; adsutural area between pores is slightly impressed. Punctation more distinct than that on pronotum, composed of larger, but shallow and diffused punctures, which are unevenly distributed, denser along suture and in posterior part of elytra; in posterior half of each elytron punctures tend to form indistinct rows transverse or slant in relation to suture. Setation similar to that on pronotum. Metathoracic wings not studied.

Legs slender, moderately long, without peculiar characters.

Aedeagus (Figs. 10-12) 0.27 mm in length (measured from base to apical margin of median lobe, without extruded internal armature), in dorso-ventral view drop-shaped with narrow, distinctly subtrapezoidal base and broad subapical part; ventral median subapical plate subrectangular with rounded tips, moderately long and relatively lightly sclerotized; lateral subapical sclerites in the only known male have apices broken off and their shape is not possible to determine, remainders are elongate and darkly sclerotized; internal armature known only in erected position, consists of broad, curved duct narrowing to pointed apex; parameres long and very broad, in lateral view weakly curved.

Female. Externally similar to male, but slightly stouter, without subapical pore on each elytron. Body length 1.87-2.07 mm (mean 1.99 mm), length of head 0.27-0.31 mm (mean 0.29 mm), width of head 0.32-0.35 mm (mean 0.34 mm), length of antennae 0.92-0.97 mm (mean 0.95 mm), length of pronotum 0.50-0.51 mm (mean 0.51 mm), width of pronotum 0.47-0.52 mm (mean 0.51 mm), length of elytra 1.10-1.25 mm (mean 1.19 mm), width of elytra 0.81-0.85 mm (mean 0.82 mm), EI 1.37-1.47.

TYPE MATERIAL

Holotype (male), two white printed labels "Gebiet von Jumla, Westnepal, lg. H. Franz", "Umg. Alm Darghari b. Maharigaon, 4000 m", white label with handwritten "Neuraphes (Pararaphes) jumlanus m." and printed "det. H. Franz", small printed label with black margins and male symbol, and red handwritten label "Typus" (NHMW). Paratype: female, with same data as holotype, except for red label "Allotypus"; 1 female, two white printed labels “Umg. Alm Darghari b. Maharigaon, 4000 m”, “Gebiet des Rarasees, Westnepal, lg. H. Franz”, and yellowish label with handwritten “Neuraphes (Pararaphes) jumlanus m.” and printed “PARATYPUS” (NHMW). Additional material: 1 female, “Umg. Maharigaon, 3000-3500 m”, “Gebiet von Jumla, Westnepal, lg. H. Franz”; 1 female, “Dampa-Paß, gegen Chauta”, “Gebiet des Rarasees, Westnepal, lg. H. Franz” (NHMW).

DISTRIBUTION

Nepal.

REMARKS

The collecting date for the type material of this species is not given on the labels; it can be found in the original description (FRANZ 1974): 23. ix. 1972. According to the same source, the beetles were sifted from a leaf litter in a *Betula* forest.

See also remarks for *N. taksangensis*.

***Neuraphes* (*Pararaphes*) *himalayanus* FRANZ**

(Fig. 3)

Neuraphes (*Pararaphes*) *himalayanus* FRANZ, 1970: 435, fig. 1; 1971: 441, fig. 1 (misidentified, not *himalayanus*).

DIAGNOSIS

The only known holotype female of this species differs from all congeners inhabiting the Himalaya Mts. in having the following combination of characters: head and pronotum nearly black, elytra, antennae and legs except tarsi dark brown, tarsi and maxillary palps light brown; vertex with small median tubercle adjacent to its posterior margin; pronotum much longer than broad, broadest at base, slightly narrowing up to front angles, with anterior margin only slightly narrower than posterior margin; median longitudinal carina on pronotum reaching to about middle; and very shallow punctation of elytra. Males and their diagnostic characters remain unknown.

REDESCRIPTION

Male. Unknown.

Female (Fig. 3). Body small and slender, length 1.54 mm; head and pronotum nearly black, elytra, antennae and legs except tarsi dark brown, tarsi and maxillary palps light brown; vestiture light brown, on darkest body parts appears silver. Head broadest at very large, coarsely faceted eyes, length 0.22 mm, width 0.29 mm; tempora in dorsal view about as long as 3/4 of eye length; vertex bears small median tubercle adjacent to its posterior margin; vertex and large posterior part of frons regularly convex; anterior part of frons steeply lowering toward clypeus; supraantennal tubercles weakly raised and not delimited from frons. Punctation on vertex and frons fine and sparse, punctures on central part of frons are barely discernable at magnification 40x. Setation of head composed of sparse, moderately long, suberect to erect setae. Antennae long and slender, gradually thickened toward apices, length 0.75 mm; antennomere I slightly more than twice as long as broad; II slightly shorter than I and at apex nearly as broad, about twice as long as broad; III much narrower than II and slightly shorter than broad; IV-VII gradually larger and each about as long as broad; VIII-X each slightly broader than long; XI much shorter than IX-X together.

Pronotum elongate, subtrapezoidal in shape, broadest at base, sides are nearly straight from straight hind angles up to anterior third, where lateral margins are slightly more convergent and more rounded than in posterior part; anterior margin weakly rounded and only slightly shorter than nearly straight posterior margin; length of pronotum 0.37 mm, width 0.35 mm. Base of pronotum with large, shallow and elongate longitudinally pit near each hind angle and very distinct, relatively high and narrow median longitudinal carina running from posterior margin to about middle of pronotal disc, carina is accompanied at each side by distinct basal impression. Basic punctation of disc very fine, composed of very small, sharply marked and sparse punctures similar to those on frons, central part of disc bears several larger but very shallow and diffused punctures distributed along midline in anterior half; setation relatively sparse, moderately long, suberect.

Elytra oval, more convex than pronotum, broadest between middle and anterior third, length 0.95 mm, width 0.65 mm, EI 1.46. Humeri moderately distinct; basal pit on each elytron large; narrow adsutural area in anterior fourth of each elytron is raised and accompanied at each side by shallow elongate impression gradually reducing in depth posteriorly, so that it smoothly disappears near anterior third of elytra. Punctation fine, composed of small, shallow, indistinctly delimited and sparsely distributed punctures; setation similar to that on pronotum. Metathoracic wings not studied.

Legs slender, moderately long, without peculiar characters.

Type material

Holotype (female): three white handwritten labels: “Himalaya, ca. 4500 m, Mingbo”, “Nepal, 28.5.-3.6.61, lg. Janetschek”, “Zwergstrauch \ heide oberh., Airstrip Hillary Makalu-Exp.”, long and narrow strip with handwritten in pencil “Np61-299/AG”, and red handwritten label “Neuraphes (Pararaphes) himalayanus m., Typus” (NHMW).

Distribution

Nepal.

Remarks

The holotype female in the Franz Coll. was placed together with a male and two females collected by Jochen Martens in “Khumbu Pare” in 1970, and identified as *N. himalayanus*. The aedeagus of the male was illustrated by Franz as belonging to *N. himalayanus* (1971, fig. 1), and this specimen bears a red label reading “Allotypus” (which is misleading, as this specimen is not a type). However, this male has a distinctly different shape of the pronotum than the holotype of *N. himalayanus*, with sides in anterior third strongly narrowing toward anterior margin, which is much shorter than the posterior one. Moreover, the median carina on the pronotal disc is much longer; it reaches as far as to the anterior fourth of the pronotum. The vertex of this male bears in its posterior part distinct longitudinal carina, not a tubercle. The carina or tubercle on the vertex may represent sexual dimorphism, and the length of the median carina on the pronotum is variable in some species of *Neuraphes*. However, clearly different shape of the pronotum cannot be regarded as such a polymorphism. This male is treated here as not conspecific to *N. himalayanus* and it is described below as a new species. The two females from Khumbu are both teneral, they are yellowish in color and their identification seems very uncertain.

In the original description Franz (1970) gives an altitude of ca. 4500 m for a collecting spot; this information is not provided on the labels.

***Neuraphes* (*Pararaphes*) *khumbuanus* n. sp.**

(Figs. 4, 13-15)

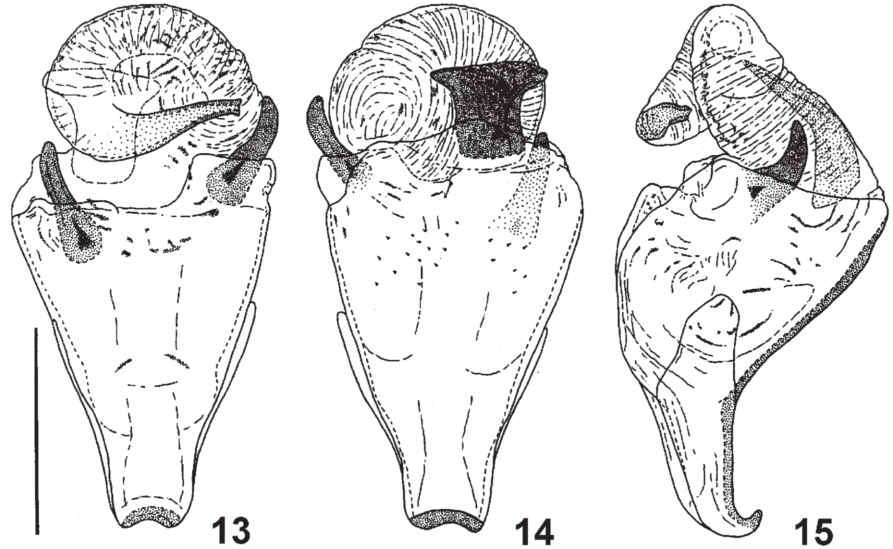
Diagnosis

The only known male of this species differs from all Himalayan congeners in having narrow but distinct, relatively long median carina in posterior part of vertex; from world representatives of *Neuraphes* it differs in unique aedeagus, which has broad and darkly sclerotized, T-shaped ventral subapical plate. Females and their diagnostic characters are unknown.

Description

Male (Fig. 4). Body moderately large, length 1.66 mm; head and pronotum nearly black, elytra, antennae and legs except tarsi brown, tarsi and maxillary palps light brown; vestiture light brown, on pronotum grayish. Head broadest at large, coarsely faceted eyes, length 0.22 mm, width 0.30 mm; tempora in dorsal view slightly longer than eye; vertex with long median longitudinal carina running from its posterior margin; vertex convex; frons in posterior part weakly convex, nearly flat, in anterior part steeply lowering toward clypeus; supraantennal tubercles weakly marked, not delimited from surrounding areas. Punctation on vertex and frons composed of relatively dense, but small and shallow, variously sharply marked punctures distributed very unevenly, surface of vertex and frons is slightly uneven, but smooth, not coarse; overall setation sparse, moderately long, suberect to erect, sides of vertex near tempora bear longer erect setae directed upwards and posteriorly, but curved toward midline of vertex. Antennae long, moderately slender, gradually thickened toward apices, length 0.80 mm; antennomere I slightly more than twice as long as broad; II slightly shorter than I and slightly narrower, about twice as long as broad; III much narrower than II and only minimally broader than long; IV about as long as broad; V and VI each slightly longer than broad; VII about as long as broad; VIII-X each slightly broader than long; XI much shorter than IX-X together.

Pronotum elongate, subtrapezoidal in shape, broadest at base, length 0.42 mm, width 0.40 mm. Anterior margin weakly arcuate, much shorter than posterior margin; sides in anterior third rounded, then nearly straight, barely noticeably convergent nearly up to hind angles, just before hind angles lateral margins are slightly expanded laterally, so that hind angles are sharp; posterior margin rounded; base of pronotum with large, moderately deep, relatively narrow and longitudinally elongate pit near each hind angle and median longitudinal carina, which is very long, reaching nearly to anterior fourth of pronotum, carina is high and very distinct in posterior 2/3, and more flat and less distinct in anterior part, it is accompanied at each side of base by distinct impression. Punctation of disc composed of very dense, but very fine and very shallow punctures, among them are unevenly and scarcely distributed larger and more distinct punctures; setation relatively sparse, moderately long, suberect.



13-18. Aedagus of holotype in dorsal (13, 16), ventral (14, 17), and lateral (15, 18) views. 13-15 – *Neuraphes khumbuanus* Jałoszyński; 16-18 – *Neuraphes tibetanus* Jałoszyński (scale bars: 0.1 mm)

Elytra oval, slightly more convex than pronotum, broadest distinctly anterior to middle, length 1.02 mm, width 1.72 mm, EI 1.42. Humeri moderately distinct; basal pit on each elytron large; narrow adsutural area in anterior third of each elytron is raised and moderately sharply delimited by relatively broad and shallow groove gradually reducing in depth toward its posterior end; apex of each elytron bears large puncture surrounded by dense setae, puncture is adjacent to suture and separated from apical angle of elytron by distance about 1.5x as long as its diameter. Punctation dense but composed of very shallow, small and diffused punctures; setation similar to that on pronotum. Metathoracic wings well developed.

Legs slender, moderately long, without peculiar characters.

Aedeagus (Figs. 13-15) 0.25 mm in length, in dorso-ventral view roughly drop-shaped with narrow, not subtrapezoidal base and broad subapical part; ventral median subapical plate T-shaped, very broad, darkly sclerotized, with subrectangular proximal part and rapidly expanded laterally distal part; lateral subapical sclerites elongate, distinctly curved, narrowing from base to blunt apices, darkly sclerotized; internal armature in the only known specimen is partly erected, and it consists of broad, spirally curved duct narrowing to tapered apex; parameres relatively short and very broad, in lateral view nearly straight.

Female. Unknown.

Type material

Holotype (male): white handwritten label "Nepal, Khumbu Pare, 3550 m, lg. Martens, 15.5.70", white label with handwritten "Neuraphes (Pararaphes) himalayanus m." and printed "det. H. Franz", red handwritten label "Allotypus" (NHMW).

Distribution

Nepal.

Remarks

Franz in his 1971 paper gave more detailed information concerning the collecting data for this specimen (misidentified as *N. himalayanus*) than what can be found on the labels: "Nangpa Tsangpo-Tal an einem *Rhododendron*-Birkenwaldrand bei Pare (...) aus Waldstreu gesiebt". See also remarks for *N. himalayanus*.

***Neuraphes* (*Pararaphes*) *tibetanus* n. sp.**

(Figs. 5, 16-18)

Diagnosis

The only known male of this species differs from other Himalayan members of *Neuraphes* in the following combination of characters: body large and slender, with nearly black head and pronotum and brown elytra; adsutural area at base of each elytron not separated by groove. The primary diagnostic character is unique aedeagus with very large, clover leaf-shaped ventral subapical plate. Females and their diagnostic features remain unknown.

DESCRIPTION

Male (Fig. 5). Body relatively large and slender; length 1.57 mm; head and pronotum nearly black, elytra, antennae and legs except tarsi brown, tarsi and maxillary palps light brown; vestiture light brown, on darkest body parts it appears grayish. Head broadest at very large, coarsely faceted eyes, length 0.27 mm, width 0.30 mm; tempora in dorsal view slightly shorter than length of eye; vertex regularly convex; frons in large posterior and median part nearly flat, in anterior part steeply lowering toward clypeus; supraantennal tubercles weakly raised. Punctation on vertex distinct, composed of sparse, small but sharply marked punctures, flattened part of frons covered with larger, but shallow punctures with smoothed margins, which are unevenly distributed, punctures between supraantennal tubercles are more sharply marked and deeper than those in posterior part of frons, separated by spaces about equal to puncture diameters. Setation of head composed of sparse, relatively long, suberect to erect setae. Antennae long and slender, gradually thickened toward apices, length 0.80 mm; antennomere I slightly more than twice as long as broad; II slightly narrower and shorter than I, slightly more than twice as long as broad; III much narrower than II and distinctly broader than long; IV slightly, V distinctly longer than broad; VI and VII each about as long as broad; VIII-X each broader than long; XI about 1.8x as long as broad.

Pronotum subtrapezoidal in shape, broadest between middle and anterior third, length 0.35 mm, width 0.38 mm. Anterior margin broadly rounded, much shorter than posterior margin; sides in anterior third rounded, in posterior part lateral margins are nearly straight and slightly convergent toward slightly obtuse hind angles; sides of posterior margin straight, short middle part slightly expanded toward scutellum; base of pronotum with large, shallow and longitudinally elongate pit near each hind angle and narrow median longitudinal carina reaching to middle of pronotum, basal part of carina is accompanied at each side by shallow impression. Punctation of disc composed of variable punctures, most of them are very small and sharply delimited, moderately dense, area along median carina bears small number of larger but relatively shallow, moderately sharply marked punctures; setation relatively sparse, moderately long, suberect.

Elytra oval, broadest distinctly anterior to middle, length 1.00 mm, width 0.67 mm, EI 1.49. Humeri moderately distinct; basal pit on each elytron large; each elytron in anterior third near suture is slightly flattened; apex of each elytron bears small pore accompanied by subcuticular globular excavation (well visible in water or glycerol mounts), pore is surrounded by setae and located on slightly raised area, much closer to adsutural than to posterior margin of elytron; adsutural area between pores is slightly impressed. Punctation slightly more distinct than that on pronotum, composed of small, moderately sharply marked punctures; setation similar to that on pronotum, but setae are distinctly thicker and more curved. Metathoracic wings well developed.

Legs slender, moderately long, without peculiar characters.

Aedeagus (Figs. 16-18) 0.30 mm in length, in dorso-ventral view rhomboidal with narrow subtrapezoidal base, broadest below apical part, which is approximately subtrapezoidal; ventral median subapical plate darkly sclerotized, very large, clover leaf-shaped, with narrow and short proximal part and very broad, rounded and laterally expanded distal part; lateral subapical sclerites elongate, in lateral view very broad, oval, darkly sclerotized; internal armature is located in apical part and well visible in dorsal view, it consists of narrow and long curved duct expanded at apex; parameres relatively short and very broad, in lateral view weakly curved.

Female. Unknown.

TYPE MATERIAL

Holotype (male), white printed label "CHINA, Prov. Sichuan, Ganzi Tibetan Auton. Pref., Litang Co., Shaluli Shan, Abies-Forest-Rest, 25 km NW Litang, 30.17.23N, 90.30.97E, 4300 m, 3. VII. 1999, leg. A. Pütz", yellow printed label "Sammlung Andreas Pütz, Eisenhüttenstadt" (CAP).

DISTRIBUTION

Chinese Tibet.

REMARKS

This species is most similar to *N. jumlanus*, from which it clearly differs in structures of the aedeagus. It is the first *Neuraphes* reported to occur in China.

***Neuraphes* (*Pararaphes*) *aruensis* FRANZ**

(Figs. 6, 19-21)

Neuraphes (*Pararaphes*) *aruensis* FRANZ, 1979: 237, fig. 2.

Neuraphes (*Pararaphes*) *kashmirensis* FRANZ; FRANZ, 1979: 236, fig. 1; FRANZ, 1981: 297, **new subjective synonym.**

DIAGNOSIS

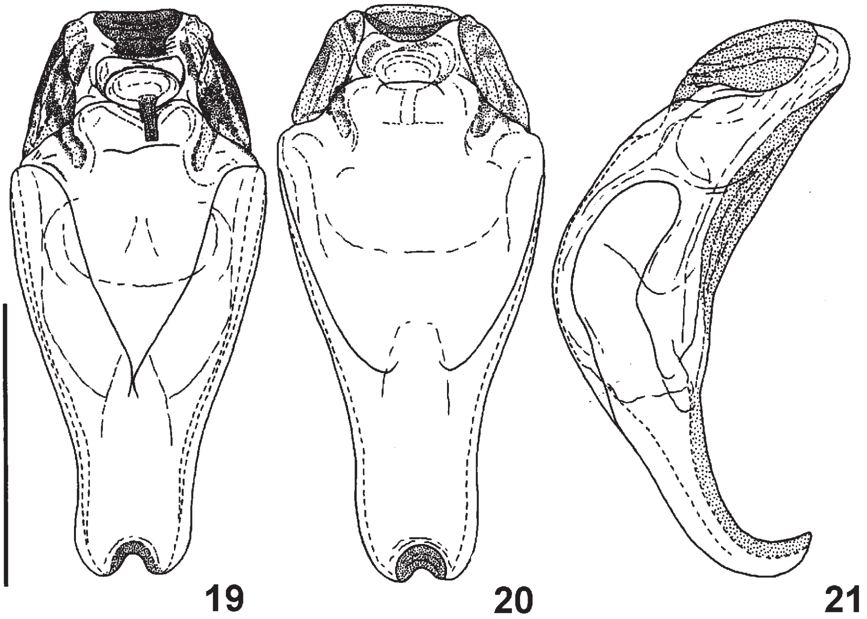
Males of this species are smaller and more slender than all other Himalayan *Neuraphes*, they are also uniformly brown. Identification must be confirmed by examination of unique aedeagus, which differs from copulatory organs of all other species of *Neuraphes*. Diagnostic characters of females are not known.

REDESCRIPTION

Male (Fig. 6). Body relatively small and slender; length 1.51-1.56 mm (mean 1.54 mm); uniformly and moderately dark brown; vestiture light brown. Head broadest at large, coarsely faceted eyes, length 0.22-0.25 mm (mean 0.23 mm), width 0.27-0.28 mm (mean 0.28 mm); tempora in dorsal view short, about as long as half length of eye; vertex and posterior part of frons convex, median part of frons flattened; supraantennal tubercles weakly raised. Punctation on vertex and posterior part of frons fine and sparse, median part of frons bears sparse but relatively large, moderately sharply marked punctures, which are very unevenly distributed, between supraantennal tubercles punctures are separated by variable spaces, from slightly less than puncture diameters to about twice as long. Setation of head composed of sparse, moderately long, suberect to erect setae, slightly longer in posterior part of vertex and on its sides. Antennae moderately long and slender, gradually thickened toward apices, length 0.70 mm; antennomere I slightly more than twice as long as broad; II slightly shorter and narrower than I, about 2.3x as long as broad; III much narrower than II and minimally broader than long; IV about as long as broad; V slightly longer than broad; VI and VII each minimally broader than long; VIII-X each distinctly broader than long; XI about 1.7x as long as broad.

Pronotum elongate, subtrapezoidal in shape, broadest between middle and anterior third, length 0.40-0.41 mm (mean 0.41 mm), width 0.37-0.40 mm (mean 0.38 mm). Anterior margin broadly rounded, in dorsal view indistinctly delimited from lateral margins, which are broadly rounded in anterior third and nearly straight in posterior part, slightly narrowing toward obtuse hind angles; posterior margin nearly straight; base of pronotum with large, shallow and longitudinally elongate pit near each hind angle and long median longitudinal carina as long as about 3/4 of length of pronotum, posterior end of carina is accompanied at each side by broad and shallow impression. Punctation of disc composed of very small, but sharply marked and dense punctures; setation relatively sparse, moderately long, suberect to erect.

Elytra oval, broadest distinctly anterior to middle, length 0.89-0.90 mm (mean 0.90 mm), width 0.60-0.62 mm (mean 0.61 mm), EI 1.45-1.48. Humeri moderately distinct; basal pit on each elytron large; narrow adsutural area in anterior third of each elytron is raised and relatively sharply delimited by broad and relatively deep groove



19-21. Aedagus of holotype of *Neuraphes aruensis* Franz in dorsal (19), ventral (20), and lateral (21) views (scale bar: 0.1 mm) gradually reducing in depth toward its posterior end; apex of each elytron bears large and shallow puncture surrounded by very short setae, puncture is located slightly closer to posterior than to adsutural margin of elytron. Punctation more distinct than that on pronotum, composed of larger, but shallow punctures with diffused margins; setation similar to that on pronotum. Metathoracic wings not studied.

Legs slender, moderately long, without peculiar characters.

Aedeagus (Figs. 19-21) 0.20 mm in length, in dorso-ventral view very slender, rhomboidal in shape, with narrow, deeply emarginate base; apical part subtrapezoidal; median plate darkly sclerotized, located at apex of median lobe and shifted strongly to dorsal surface, broad, with rounded ventral margin and rapidly narrowed dorsal part with tapered proximal margin; lateral subapical sclerites elongate, irregular in shape, darkly sclerotized; internal armature located in subapical part and well visible in dorsal view, it consists of short and narrow distal duct attached to broad, oval and lightly sclerotized proximal structure; parameres very long, broad, in lateral view rapidly bent at obtuse angle.

Female. Unknown (see remarks).

Type material

Holotype (male), white printed label "Kashmir, Aru, lg. H. Franz, Okt. 1977" with "Pa 319" handwritten in blue on its reverse, yellowish label with handwritten "Neuraphes (Pararaphes) aruensis m." and printed "det. H. Franz", and red handwritten label "Holotypus" (NHMW). Additional material: male, "Kashmir, Chandanwari b. Pahalgam, 2800-3100 m, lg. H. Franz, Okt. 1977", "Pa 324" on the label's reverse, labeled as holotype of *Neuraphes* (*Pararaphes*) *kashmirensis* (NHMW).

Distribution

Kashmir.

Remarks

Holotypes of *N. aruensis* and *N. kashmirensis* are extremely similar, and their aedeagi do not show any differences justifying their placement as separate species. They were described in the same paper, and the name *N. aruensis* is selected here to be valid, which places *N. kashmirensis* as a junior subjective synonym. A single female collected by Franz and included into the type series of *N. kashmirensis* differs from the two males in having darker pigmentation, it is also larger. It may or may not belong to the same species; its determination is here regarded as uncertain.

According to Franz (1979), individuals of this species were collected from leaf litter and rotten wood in an *Abies webbiana* forest with *Viburnum foetens*, and from leaf litter, rotten wood and humus in a deciduous forest with predominating *Acer caesius* and *Padus cornuta*. The latter locality, described on the label as "Chandanwari b. Pahalgam", is more precisely named in the original description as "Joa Gaiti".

Scydmoraphes gartneri **(FRANZ) n. comb.**

(Figs. 22-24)

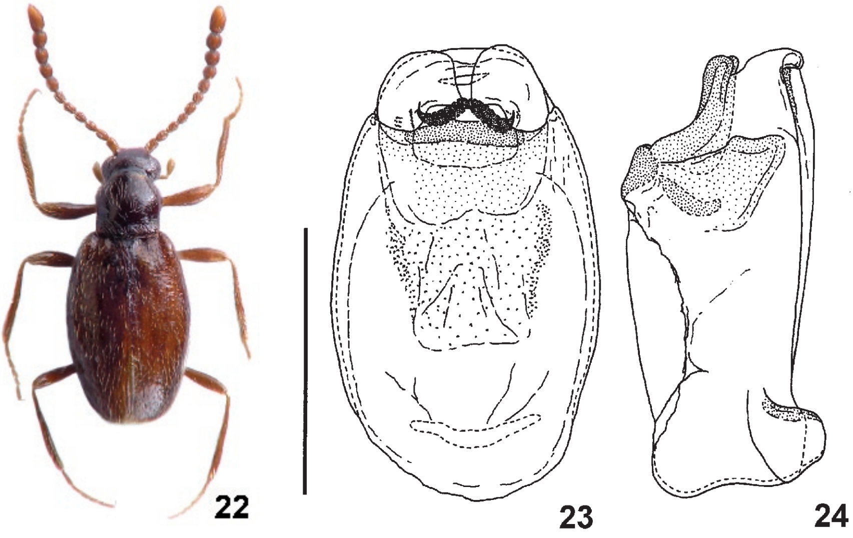
Neuraphes (*Pararaphes*) *gartneri* FRANZ, 1979: 237, fig. 3.

TYPE MATERIAL STUDIED

Holotype (male), two white printed labels "Naltartal Umg. Jagot 1.-4. VIII. 1974 lg. P Gartner", "Karakorumexped. 1974 Leiter Helmut Linzbichler", yellowish label with handwritten "Neuraphes (Pararaphes) gartneri m." and printed "det. H. Franz", and red handwritten label "Holotypus" (NHMW).

REMARKS

This remarkable species (Fig. 22) from a northern part of Pakistan certainly does not belong to *Neuraphes*. The latter genus has always disrupted or interrupted transverse groove or row of pits on the pronotum, and the aedeagus with weakly sclerotized, but very broad parameres without apical setae. The groove on the pronotum in *Neuraphes gartneri* is entire, with no trace of interrupting gap or longitudinal carina, despite FRANZ's clear statement that the groove is "in der Mitte von einem Längskiel durchsetz" (FRANZ 1979). All other external characters agree with those given in the original description, except for the body length, which is not 1.25 mm but 1.47 mm. The very small aedeagus (Figs. 23-24) has apparently the parameres broken off, but the remainders at their basal part suggest that they have been rather slender. The general shape of the aedeagus and its internal armature does not resemble typical structures known in *Neuraphes*. Both the groove on the pronotum and the aedeagus are typical for a similar genus, *Scydmoraphes*, in which this species indeed belongs. In the original description FRANZ (1979)



22-24. *Scydmoraphes gartneri* (FRANZ), male: 22 – dorsal habitus of holotype, 23 – aedagus in dorsal view, 24 – aedeagus in lateral view (scale bar for genitalia: 0.1 mm) gives more precise collecting data than what the label read; with the date 3. viii. 1974, and an additional geographic name "Gilgit ad Jagot".

The lack of the parameres is a more general problem in the current generic system of the Scydmaenidae. Lack of these structures was erroneously treated by FRANZ as a diagnostic character of *Neuraphes*. In fact, aedeagi in this genus have very large, but lightly sclerotized parameres, which may be hardly visible in dorsal and ventral position, but they are usually easily noticeable in lateral view. A careful preparation is very important in the case of *Neuraphes* and *Scydmoraphes*. These genera have thin-walled and lightly sclerotized median lobes which are exceptionally fragile and prone to distortion. Cases of broken or completely missing parameres are common in the FRANZ Collection. This is a significant problem, as FRANZ has established several genus-group names solely on the basis of the aedeagi without parameres. Examination of the type material of some of such genera reveals that sometimes it is very difficult (and even not possible) to figure out whether the aedeagus really lacks the parameres or they have been lost during preparation.

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